FORM PTO-1390 (REV 10-94) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE				DOCKET #: 4925-218PUS
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				
				U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 10/070837
INTERNATIONAL APPLICATION NO PCT/IB00/01322		INTERNATIONAL FILING DATE 05 September 2000		PRIORITY DATE CLAIMED 13 September 1999

TITLE OF INVENTION

Satisfying Data Requests in a Telecommunication System

APPLICANT(S) FOR DO/EO/US

Sami USKELA; Aapo RAUTIANEN; Eva Maria LEPPANEN; Lucia TUDOSE; Mari NIEMINEN

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. [x] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371
3. [x] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. [x] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. [x] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [x] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [x] has been transmitted by the International Bureau.
   c. [] is not required, as the application was filed in the United States Receiving Office (RO/US)
6. [] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [x] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C 371(c)(3))
   a. [] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [] have been transmitted by the International Bureau.
   c. [] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [x] have not been made and will not be made.
8. [] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [x] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). **Unexecuted**
10. [] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. Below concern other document(s) or information included:

11. [x] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [x] A **FIRST** preliminary amendment.
    [] A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. [] A substitute specification.
15. [] A change of power of attorney and/or address letter.
16. [x] Other items or information *(specify)*: PCT Publication Sheet, Int'l Preliminary Examination Report, Int'l Search Report, PCT Request, PCT Demand, Notice Informing the Applicant of the Communication of the International Application to the Designated Offices, Notification of the Recording of a Change

U.S. APPLICATION NO (If known, see 37 C.F.R. 1.5) 10/070837	INTERNATIONAL APPLICATION NO PCT/IB00/01322	ATTORNEY'S DOCKET NUMBER 4925-218PUS

17.[x]The following fees are submitted:		
Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO .. ..**$890.00** International preliminary examination fee paid to USPTO (37 CFR 1.482). .. ..**$710.00** No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) .. ..**$740.00** Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO ....**$1040.00** International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) **$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$	890
Surcharge of **$130.00** for furnishing the oath or declaration later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$	

Claims	Number Filed	Number Extra	Rate		
Total Claims	80 - 20 =	60	x **$18.00**	$	1080
Independent Claims	1 - 3 =	0	x **$84.00**	$	
Multiple dependent claim(s) (if applicable)			+ **$280.00**	$	

TOTAL OF ABOVE CALCULATIONS =	$	1970
Reduction of ½ for filing by small entity, if applicable.	$	
SUBTOTAL =	$	1970
Processing fee of **$130.00** for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +	$	
TOTAL NATIONAL FEE =	$	1970
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by the appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +	$	
TOTAL FEES ENCLOSED		$1970
Amount to be refunded:		$
charged:		$

a. [x] One checks in the amounts of $ 1970 to cover the above fees is enclosed.
b. [] Please charge my Deposit Account No. 03-2412 in the amount of $_____ to cover the above fees. A duplicate copy of this sheet is enclosed.
c. [x] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 03-2412. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO
Michael C. Stuart
Cohen, Pontani, Lieberman & Pavane
551 Fifth Avenue, Suite 1210
New York, New York 10176

Michael C. Stuart
Registration Number: 35,698 March 11, 2002
Tel: (212) 687-2770

Attorney Docket # 4925-218PUS

Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Sami USKELA et al.

Serial No.: 10/070,837

Filed: March 11, 2002

For: Satisfying Data Requests in a Telecommunication System

Examiner:
Group Art:

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Assistant Commissioner for Patents, Washington, D.C. 20231, on

July 17, 2002
(Date of Deposit)

Michael C. Stuart
Name of applicant, assignee or Registered Representative

Signature

July 17, 2002
Date of Signature

Assistant Commissioner for Patents
Washington, DC 20231

SECOND PRELIMINARY AMENDMENT

S I R:

Prior to examination of the above-identified application, amend the application as follows:

IN THE SPECIFICATION:

Page 1, before line 2, before the insert added in the first Preliminary Amendment, the title beginning with "**FIELD OF THE INVENTION**", insert the following title and paragraph:

--PRIORITY CLAIM

This is a national stage of PCT application No. PCT/IB00/01322, filed on September 5, 2000. Priority is claimed on that application, and on patent application No. 9921583.2 filed in Great Britain on September 13, 1999.--

REMARKS

This preliminary amendment is presented to complete the claim for priority. Early examination and favorable consideration of the above-identified application is earnestly solicited.

Any additional fees or charges required at this time in connection with the application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

COHEN, PONTANI, LIEBERMAN & PAVANE

By _____

Michael C. Stuart
Reg. No. 35,698
551 Fifth Avenue, Suite 1210
New York, N.Y. 10176
(212) 687-2770

July 17, 2002

By Express Mail # EL489597367US · March 11, 2002

#3/3

Attorney Docket # 4925-218PUS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re National Phase PCT Application of

Sami USKELA et al.

International Appln. No.: PCT/IB00/01322

International Filing Date: 05 September 2000

For: Satisfying Data Requests in a Telecommunication System

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231
BOX PCT

S I R:

Prior to examination of the above-identified application, amend the application as follows:

IN THE SPECIFICATION:

Page 1, before line 2, the paragraph beginning with "This invention relates", insert the following title:

--**FIELD OF THE INVENTION**--.

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Page 1, before line 4, the paragraph beginning with "Figure 1 is", insert the following title:

--**BACKGROUND OF THE INVENTION**--.

Page 2, before line 18, the paragraph beginning with "According to one", insert the following title:

--**SUMMARY OF THE INVENTION**--.

Page 5, before line 8, the paragraph beginning with "The present invention", insert the following paragraph and title:

-- Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are intended solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS--.

Page 5, before line 13, the paragraph beginning with "Figure 2 illustrates", insert the following title:

--**DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS**--.

Page 9, after the last line, insert the following paragraph:

--Thus, while there have been shown and described and pointed out fundamental novel features of the present invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices described and illustrated, and in their operation, and of the methods described may be made by those skilled in the art without departing from the spirit of the present invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Substitutions of elements from one described embodiment to another are also fully intended and contemplated. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended hereto.--.

Page 10, line 1, delete "CLAIMS" and insert therefor --What is claimed is:--.

IN THE CLAIMS:

Cancel claims 16 and 17, without prejudice.

Amend 5, 7, 9-14 to read as follows:

5. A telecommunications system as claimed in claim 1, wherein an internet protocol link can be supported between the telecommunications unit and the target address.

7. A telecommunications system as claimed in claim 1, wherein the telecommunications unit is capable of communicating by radio with the telecommunications system.

9. A telecommunications system as claimed in claim 1, wherein the telecommunications system is a cellular telecommunications system.

10. A telecommunications system as claimed in claim 1, wherein the data comprises hypertext transfer protocol data.

11. A telecommunications system as claimed in claim 1, wherein the target address is a universal resource locator address.

12. A telecommunications system as claimed in claim 1, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

13. A telecommunications system as claimed in claim 1, wherein the said indication is sent by means of a data push facility.

14. A telecommunications system as claimed in claim 1, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

Add the following new claims:

18. A telecommunications system as claimed in claim 2, wherein an internet protocol link can be supported between the telecommunications unit and the target address.

19. A telecommunications system as claimed in claim 3, wherein an internet protocol link can be supported between the telecommunications unit and the target address.

20. A telecommunications system as claimed in claim 4, wherein an internet protocol link can be supported between the telecommunications unit and the target address.

21. A telecommunications system as claimed in claim 2, wherein the telecommunications unit is capable of communicating by radio with the telecommunications system.

22. A telecommunications system as claimed in claim 3, wherein the telecommunications unit is capable of communicating by radio with the telecommunications system.

23. A telecommunications system as claimed in claim 4, wherein the telecommunications unit is capable of communicating by radio with the telecommunications system.

24. A telecommunications system as claimed in claim 5, wherein the telecommunications unit is capable of communicating by radio with the telecommunications system.

25. A telecommunications system as claimed in claim 6, wherein the telecommunications unit is capable of communicating by radio with the telecommunications system.

26. A telecommunications system as claimed in claim 2, wherein the telecommunications system is a cellular telecommunications system.

27. A telecommunications system as claimed in claim 3, wherein the telecommunications system is a cellular telecommunications system.

28. A telecommunications system as claimed in claim 4, wherein the telecommunications system is a cellular telecommunications system.

29. A telecommunications system as claimed in claim 5, wherein the telecommunications system is a cellular telecommunications system.

30. A telecommunications system as claimed in claim 6, wherein the telecommunications system is a cellular telecommunications system.

31. A telecommunications system as claimed in claim 7, wherein the telecommunications system is a cellular telecommunications system.

32. A telecommunications system as claimed in claim 8, wherein the telecommunications system is a cellular telecommunications system.

33. A telecommunications system as claimed in claim 2, wherein the data comprises hypertext transfer protocol data.

34. A telecommunications system as claimed in claim 3, wherein the data comprises hypertext transfer protocol data.

35. A telecommunications system as claimed in claim 4, wherein the data comprises hypertext transfer protocol data.

36. A telecommunications system as claimed in claim 5, wherein the data comprises hypertext transfer protocol data.

37. A telecommunications system as claimed in claim 6, wherein the data comprises hypertext transfer protocol data.

38. A telecommunications system as claimed in claim 7, wherein the data comprises hypertext transfer protocol data.

39. A telecommunications system as claimed in claim 8, wherein the data comprises hypertext transfer protocol data.

40. A telecommunications system as claimed in claim 9, wherein the data comprises hypertext transfer protocol data.

41. A telecommunications system as claimed in claim 2, wherein the target address is a universal resource locator address.

42. A telecommunications system as claimed in claim 3, wherein the target address is a universal resource locator address.

43. A telecommunications system as claimed in claim 4, wherein the target address is a universal resource locator address.

44. A telecommunications system as claimed in claim 5, wherein the target address is a universal resource locator address.

45. A telecommunications system as claimed in claim 6, wherein the target address is a universal resource locator address.

46. A telecommunications system as claimed in claim 7, wherein the target address is a universal resource locator address.

47. A telecommunications system as claimed in claim 8, wherein the target address is a universal resource locator address.

48. A telecommunications system as claimed in claim 9, wherein the target address is a universal resource locator address.

49. A telecommunications system as claimed in claim 10, wherein the target address is a universal resource locator address.

50. A telecommunications system as claimed in claim 2, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

51. A telecommunications system as claimed in claim 3, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

52. A telecommunications system as claimed in claim 4, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

53. A telecommunications system as claimed in claim 5, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

54. A telecommunications system as claimed in claim 6, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

55. A telecommunications system as claimed in claim 7, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

56. A telecommunications system as claimed in claim 8, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

57. A telecommunications system as claimed in claim 9, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

58. A telecommunications system as claimed in claim 10, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

59. A telecommunications system as claimed in claim 11, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

60. A telecommunications system as claimed in claim 2, wherein the said indication is sent by means of a data push facility.

61. A telecommunications system as claimed in claim 3, wherein the said indication is sent by means of a data push facility.

62. A telecommunications system as claimed in claim 4, wherein the said indication is sent by means of a data push facility.

63. A telecommunications system as claimed in claim 5, wherein the said indication is sent by means of a data push facility.

64. A telecommunications system as claimed in claim 6, wherein the said indication is sent by means of a data push facility.

65. A telecommunications system as claimed in claim 7, wherein the said indication is sent by means of a data push facility.

66. A telecommunications system as claimed in claim 8, wherein the said indication is sent by means of a data push facility.

67. A telecommunications system as claimed in claim 9, wherein the said indication is sent by means of a data push facility.

68. A telecommunications system as claimed in claim 10, wherein the said indication is sent by means of a data push facility.

69. A telecommunications system as claimed in claim 11, wherein the said indication is sent by means of a data push facility.

70. A telecommunications system as claimed in claim 12, wherein the said indication is sent by means of a data push facility.

71. A telecommunications system as claimed in claim 2, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

72. A telecommunications system as claimed in claim 3, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

73. A telecommunications system as claimed in claim 4, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

74. A telecommunications system as claimed in claim 5, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

75. A telecommunications system as claimed in claim 6, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

76. A telecommunications system as claimed in claim 7, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

77. A telecommunications system as claimed in claim 8, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

78. A telecommunications system as claimed in claim 9, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

79. A telecommunications system as claimed in claim 10, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

80. A telecommunications system as claimed in claim 11, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

81. A telecommunications system as claimed in claim 12, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

82. A telecommunications system as claimed in claim 13, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

By Express Mail # EL489597367US March 11, 2002

REMARKS

This preliminary amendment is presented to place the application in proper form for examination and to eliminate multiple dependency from the present claims. No new matter has been added. Early examination and favorable consideration of the above-identified application is earnestly solicited.

Attached hereto is a mark-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**".

Any additional fees or charges required at this time in connection with the application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,
COHEN, PONTANI, LIEBERMAN & PAVANE

By: _____

Michael C. Stuart
Reg. No. 35,698
551 Fifth Avenue, Suite 1210
New York, N.Y. 10176
(212) 687-2770

11 March 2002

By Express Mail # EL489597367US March 11, 2002

AMENDMENTS TO THE SPECIFICATION AND CLAIMS SHOWING CHANGES

In the Claims:

5. A telecommunications system as claimed in [any preceding] claim 1, wherein an internet protocol link can be supported between the telecommunications unit and the target address.

7. A telecommunications system as claimed in [any preceding] claim 1, wherein the telecommunications unit is capable of communicating by radio with the telecommunications system.

9. A telecommunications system as claimed in [any preceding] claim 1, wherein the telecommunications system is a cellular telecommunications system.

10. A telecommunications system as claimed in [any preceding] claim 1, wherein the data comprises hypertext transfer protocol data.

11. A telecommunications system as claimed in [any preceding] claim 1, wherein the target address is a universal resource locator address.

12. A telecommunications system as claimed in [any preceding] claim 1, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

13. A telecommunications system as claimed in [any preceding] claim 1, wherein the said indication is sent by means of a data push facility.

14. A telecommunications system as claimed in [any preceding] claim 1, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

SATISFYING DATA REQUESTS IN A TELECOMMUNICATIONS SYSTEM

This invention relates to a telecommunications system having means for attempting to satisfy requests for data. The telecommunications system could, for example, be a cellular telephone system.

Figure 1 is a simplified schematic diagram of a cellular telephone system. A cellular telephone 1 can communicate by radio with a base station 2 of a cellular network indicated at 3. The cellular network is connected to other telecommunications networks such as a circuit switched public telephone network 4 and a packet switched network such as the internet 5. By means of the radio connection to the cellular network, and the routing and control equipment in the cellular network 3, the cellular telephone can communicate with other telecommunications units such as another cellular telephone 10, a land-line telephone 11 or a terminal 12 connected to the internet. The terminal 12 could communicate with the cellular telephone 1 for any available packet data service such as e-mail or supply of world-wide web (WWW) pages.

In a number of packet-based services, of which WWW is one example, data held on one terminal (the target terminal) is requested by another terminal. If the target terminal is able to meet the request then it transmits the data towards the requesting terminal and the data can then be routed to the requesting terminal by the intermediate network. It may happen that due to the state of the network or the target terminal the request for data cannot be satisfied. This may, for example, occur if the network is unable to route the request to the target terminal - due to a fault or a traffic overload - or if the target terminal itself is unavailable or too busy to deal with the request. In these circumstances the request might not be satisfied. For instance, a terminal such as cellular telephone 1 may request a WWW page from WWW server 13 connected to the internet. If the server 13 is busy then the request might not be satisfied, and the requested WWW page might not be supplied to the requesting terminal 1. In such a situation, where the

requesting terminal's request is not satisfied, the requesting terminal may transmit another request for the data. Such re-requesting may be provided as a feature of data software such as a web-browser operating on the terminal 1, in a similar manner to such features on personal computers with wire-line links to the internet.

The inventors of the present invention have recognised that the approach described above for re-requesting data can have several disadvantages in a system in which the requesting terminal is connected by radio to the network via which the data is to be provided. First, in such an environment the radio message carrying the repeated request from the requesting terminal generates additional radio traffic which may cause additional radio interference with other users - especially in a system such as the proposed W-CDMA system in which more than one local user can transmit on the same radio frequency at the same time. Second, there may be a considerable delay before the target terminal is available to provide the data and several re-requests may be needed before the data is provided. In the approach described above the requesting terminal remains connected by radio so as to make those requests - this again increases network traffic, and may also mean that the user's phone bill is increased.

According to one aspect of the present invention there is provided a telecommunications system for receiving from a telecommunications unit a request for data from a target network address, the system comprising: request means for receiving the first request and transmitting a request for the data to the target address; and response means for, on receiving the data from the target address, transmitting the data to the telecommunications unit; and wherein the request means comprises completion means for, if it is determined that the request to the target address is not satisfied: attempting to establish communication with the target address, and if it is determined that such communication is possible transmitting an indication to the telecommunications unit.

The system could be arranged so that the request completion means is not automatically activated when a request is made by the telecommunications unit. The request completion means could be activated only if the request is not satisfied. If a request is not satisfied the telecommunications unit could inquire of its user (for example in response to a message from the telecommunications system) whether the request completion means is to be activated.

The telecommunications system could comprise a buffer for storing the said data until the telecommunications unit is available to receive it.

According to a second aspect of the present invention there is provided a method for operating a radio telecommunications network, comprising the steps of: receiving by radio from a telecommunications unit a request for data from a target network address; transmitting a request for the data to the target address; on receiving the data from the target address, transmitting the data to the telecommunications unit; and if it is determined that the request to the target address is not satisfied: attempting to establish communication with the target address, and if it is determined that such communication is possible transmitting an indication to the telecommunications unit.

The transmitting of the said request to the target address may involve a message generated by the telecommunications unit being forwarded to the target address or may involve another message generated by the system being forwarded to the target address.

The said attempting to establish communication with the target address may involve polling the target address to determine whether it is capable of data communication to meet the request or may involve repeating the request.

The said indication may be an indication that the target address (or a terminal at that address) is capable of data communication, or may be an indication comprising the requested data or substitute data. If the requested data is to be

transmitted to the telecommunications unit, especially if it is to be transmitted after an attempt to establish communication as mentioned above, then it may be pushed by the system to the telecommunications unit, for example by means of the "push" facility of the wireless application protocol (WAP).

The request could be queued at a terminal or associated equipment at the target address. The data could then be provided by when its turn arises in the corresponding queue.

Suitably the said attempting to establish communication comprises repeating the transmission of the request to the target address. The said determination that such communication is possible may be made on receipt of the said data from the target address and the said transmitting of an indication comprises transmitting the data to the telecommunications unit. Alternatively, or in addition, the said attempting to establish communication may comprises polling the target address to determine whether communication can be made with the target address.

Preferably an internet protocol link can be supported between the telecommunications unit and the target address. A terminal addressable by means of the target address is preferably adapted for packet data communication by means of the target address. Such a terminal may be a world-wide web server or other data server. Such a terminal may comprise a store capable of storing data for transmission over a packet link. Preferably an internet protocol link adapted for use over a radio link can be supported between the telecommunications system and the telecommunications unit.

The telecommunications unit is suitably capable of communicating by radio with the telecommunications system. The telecommunications unit may be a mobile telephone.

The telecommunications system is preferably a cellular telecommunications system.

The said data preferably comprises hypertext transfer protocol data.

The said target address is preferably a universal resource locator address.

The completion means is preferably capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

In each aspect of the invention the mobile unit may, for example, be a radio telephone.

The present invention will now be described by way of example with reference to the accompanying drawings, in which:

figure 1 illustrates a cellular telephone system; and

figure 2 illustrates the architecture of a specific aspect of a cellular telephone system.

Figure 2 illustrates a mobile station 70 in connection with a cellular telephone network 71 via a radio link 72. The cellular telephone network is connected to other networks 73, 74. In this example, network 73 is a circuit switched (CS) network such as a public switched telephone network (PSTN), and network 74 is a packet switched (PS) network such as the internet. The cellular telephone network 71 may be capable of providing the mobile station with a connection to a terminal in the CS network or the PS network so that the mobile station can exchange CS data (such as conventional voice traffic) or PS data (such as data packets) with the terminal.

A terminal 75 is connected to the packet switched network 74. The terminal 75 is accessible by means of its address in the network, which may suitably be an IP address or URL. The terminal 75 suitably includes a storage means 76 such as a hard disc or other electronic storage medium that stores data. The terminal 75 may be configured to transmit data from the storage means to another location in

response to a request for that data. One example of such a system is for the terminal 75 to represent a world-wide web (WWW) server and for the storage means 76 to store web pages. Then requests for web pages that are addressed to the server 75 and that specify the address of an originating terminal may be routed to the server 75 by the network 74. On receiving a request the server generates a response message that is addressed to the originating terminal and that contains the requested page and transmits that message towards the originating terminal over the network 74. The response message is directed by the network 74 to the originating terminal which then decodes the message and displays or otherwise processes the page data.

The mobile station 70 may be capable of supporting a PS network protocol stack such as TCP/IP (transmission control protocol / internet protocol) by means of which it may be able to establish a connection via the cellular telephone network 71 to the PS network 74, and communicate with the web server 75. The protocol stack supported by the mobile station may be a conventional protocol stack such as standard TCP/IP or may be a protocol stack that is enhanced for use over radio links such as link 72 by tolerating higher error rates and/or longer gaps in communications than are normally tolerated for fixed data links. In the latter case, which is illustrated in figure 2, the enhanced stack is used at the mobile station (at 77) and runs to a gateway unit 78 in the cellular network which operates the enhanced stack (at 79) for its communications with the mobile station and a conventional stack (at 80) for its communications with the PS network 74. A communicating unit connected to the PS network (such as server 75) correspondingly uses the conventional stack (at 81).

Instead of TCP/IP other suitable network protocols or protocol stacks could be used.

The mobile station 70 may make a request for data to a unit such as server 75 in the PS network. If the server 75 or a link to it is busy then the request may be rejected or not answered, and the data will not be supplied to the mobile station

70. As explained above, it would be desirable for there to be a means for such a request to be satisfied.

Cellular network 71 includes a request completion unit 82. The request completion unit 82 is illustrated as a distinct unit in figure 2 but it could in practice be integrated with another network unit and/or provided by means of suitable software rather than dedicated hardware. The purpose of the request completion unit is to attempt completion of unanswered requests for packet data by the mobile station 70. If the mobile station 70 requests data (e.g. a web page) from an object terminal (e.g. server 76) that cannot satisfy the request, for example because it is down (inoperative), busy or unreachable the request completion unit repeats the request automatically. It is hoped that the requested data will be provided in response to that request, whereupon that data can be forwarded to the mobile station 70 so as to meet its request for the data. If the data is still not provided the request completion unit may repeat the request again.

The request completion unit may determine that a request has not been satisfied by means of one or both of:

i. no response to a request having been received after a preset time period;

ii. a message having been received indicating that the request cannot be satisfied (for example, indicating that the object terminal is busy or unreachable);

or by another means such as by the receipt of an appropriate error message.

In order for the request completion unit to perform its function it should be aware of request messages from the mobile station 70 and responses to those messages, and/or of return messages indicating that requests from the mobile station cannot be satisfied. For the first of those cases the network 71 is preferably configured so that when the mobile station 70 issues a request for packet data (for example a request for a web page), that request is transmitted to the request completion unit 82. The request completion unit 82 may then either:

i. generates a corresponding request (for the same data and from the same source as are specified in the request from the mobile station) and transmits that request to the PS network 75; or

ii. forwards the request directly on to the PS network 75 having logged it.

Then, if the request is satisfied by a response from the object terminal in network 75 (for example server 76) the resulting data is forwarded, possibly via completion unit 82, to the mobile station. But if the request is not satisfied after a preset period or if a return message indicating an error or unreachable condition is received then the completion unit may take action to repeat the request. The request completion unit includes a store for storing data on outstanding requests.

Instead of repeating the request the request completion unit could poll the address to which the request was directed to determine when the unit at that address was again accessible, and then notify the mobile station 70, which generated the request, that the unit was accessible. The mobile station 70 could then repeat the request itself if necessary.

The user could be given an altering message, for example as a visual message, a beep or a ringing tone, when the data has been or can be received by the terminal. The terminal could be capable of displaying a list of addresses from which data had been unsuccessfully requested but which are now available for providing data.

The system described above has significant advantages over other approaches, such as relying on the mobile station 70 to repeat requests for the wanted data. If the mobile station 70 repeats requests for the wanted data, that involves increased traffic over the air interface to the cellular network 70. That causes increased signalling load in the network and, in a system in which radio communication by the mobile station 70 may interfere with transmissions of other mobile stations (as in the proposed wideband code division multiple access (W-CDMA) system) increased inter-user interference.

The request completion unit may provide additional functionality, especially in a system that included the general packet radio service (GPRS) or the like. For instance, if there is a delay before the requested data can be provided or before the request completion unit is able to indicate that the object terminal is able to accept requests, the user terminal 70 may have dropped its traffic connection with the network 71. In that case the request completion unit may be able to re-establish that connection, for example by means of a mobile terminated PDP context activation procedure.

It will be appreciated that the cellular network could be operable according to any suitable protocol, for example the GSM (Global System for Mobile Communications) system, the proposed W-CDMA system or derivatives thereof.

The mobile station could be a mobile telephone - which could be provided with software to support web browsing or the like, or could be connected to a personal computer to provide that device with radio network connectivity. In particular, the mobile telephone could have mobile data communicator functionality.

The present invention may include any feature or combination of features disclosed herein either implicitly or explicitly or any generalisation thereof, irrespective of whether it relates to the presently claimed invention. In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the invention.

CLAIMS

1. A telecommunications system for receiving from a telecommunications unit a request for data from a target network address, the system comprising:

request means for receiving the first request and transmitting a request for the data to the target address; and

response means for, on receiving the data from the target address, transmitting the data to the telecommunications unit;

and wherein the request means comprises completion means for, if it is determined that the request to the target address is not satisfied:

i. attempting to establish communication with the target address, and

ii. if it is determined that such communication is possible transmitting an indication to the telecommunications unit.

2. A telecommunications system as claimed in claim 1, wherein the said attempting to establish communication comprises repeating the transmission of the request to the target address.

3. A telecommunications system as claimed in claim 2, wherein the said determination that such communication is possible is made on receipt of the said data from the target address and the said transmitting of an indication comprises transmitting the data to the telecommunications unit.

4. A telecommunications system as claimed in claim 1, wherein the said attempting to establish communication comprises polling the target address to determine whether communication can be made with the target address.

5. A telecommunications system as claimed in any preceding claim, wherein an internet protocol link can be supported between the telecommunications unit and the target address.

6. A telecommunications system as claimed in claim 5, wherein an internet protocol link adapted for use over a radio link can be supported between the telecommunications system and the telecommunications unit.

7. A telecommunications system as claimed in any preceding claim, wherein the telecommunications unit is capable of communicating by radio with the telecommunications system.

8. A telecommunications system as claimed in claim 7, wherein the telecommunications unit is a mobile telephone.

9. A telecommunications system as claimed in any preceding claim, wherein the telecommunications system is a cellular telecommunications system.

10. A telecommunications system as claimed in any preceding claim, wherein the data comprises hypertext transfer protocol data.

11. A telecommunications system as claimed in any preceding claim, wherein the target address is a universal resource locator address.

12. A telecommunications system as claimed in any preceding claim, wherein the completion means is capable of re-establishing a connection with the telecommunications unit in order for the said indication to be carried to the telecommunications unit.

13. A telecommunications system as claimed in any preceding claim, wherein the said indication is sent by means of a data push facility.

14. A telecommunications system as claimed in any preceding claim, wherein the telecommunications unit is capable of alerting a user of the terminal that the said data is available.

15. A method for operating a radio telecommunications network, comprising the steps of:

receiving by radio from a telecommunications unit a request for data from a target network address;

transmitting a request for the data to the target address;

on receiving the data from the target address, transmitting the data to the telecommunications unit; and

if it is determined that the request to the target address is not satisfied:

i. attempting to establish communication with the target address, and

ii. if it is determined that such communication is possible transmitting an indication to the telecommunications unit.

16. A telecommunications system substantially as herein described with reference to figure 2 of the accompanying drawings.

17. A method for operating a telecommunications system substantially as herein described with reference to figure 2 of the accompanying drawings.

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(71) Applicant *(for all designated States except US)*: **NOKIA NETWORKS OY** [FI/FI]; Keilalahdentie 4, FIN-02150 Espoo (FI).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **USKELA, Sami** [FI/FI]; Nokia Networks Oy, Keilalahdentie 4, FIN-02150 Espoo (FI). **RAUTIAINEN, Aapo** [FI/FI]; Nokia Networks Oy, Keilalahdentie 4, FIN-02150 Espoo (FI). **LEPPANEN, Eva, Maria** [FI/FI]; Nokia Networks Oy, Keilalahdentie 4, FIN-02150 Espoo (FI). **TUDOSE, Lucia** [RO/FI]; Nokia Networks Oy, Keilalahdentie 4, FIN-02150 Espoo (FI). **NIEMINEN, Mari** [FI/FI]; Nokia Networks Oy, Keilalahdentie 4, FIN-02150 Espoo (FI).

(74) Agents: **SLINGSBY, Philip, Roy** et al.; Page White & Farrer, 54 Doughty Street, London WC1N 2LS (GB).

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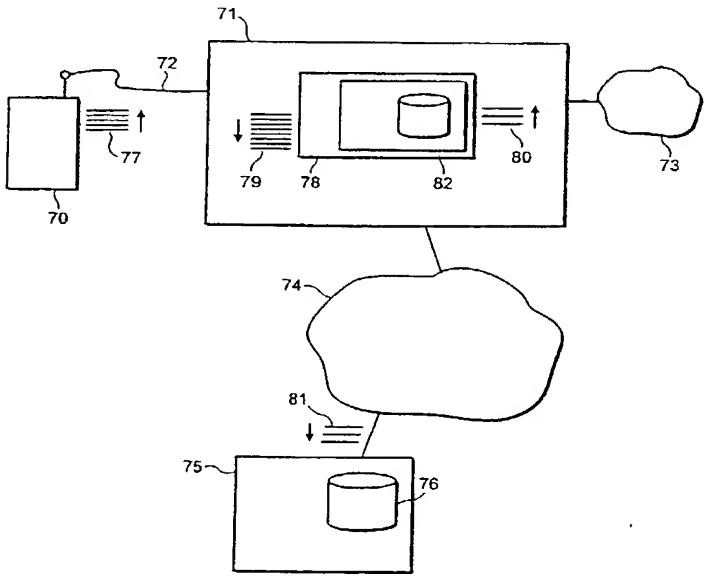
[Continued on next page]

(54) Title: SATISFYING DATA REQUESTS IN A TELECOMMUNICATIONS SYSTEM



(57) Abstract: A telecommunications system for receiving from a telecommunications unit a request for data from a target network address, the system comprising: request means for receiving the first request and transmitting a request for the data to the target address; and response means for, on receiving the data from the target address, transmitting the data to the telecommunications unit; and wherein the request means comprises completion means for, if it is determined that the request to the target address is not satisfied: attempting to establish communication with the target address, and if it is determined that such communication is possible transmitting an indication to the telecommunications unit.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette

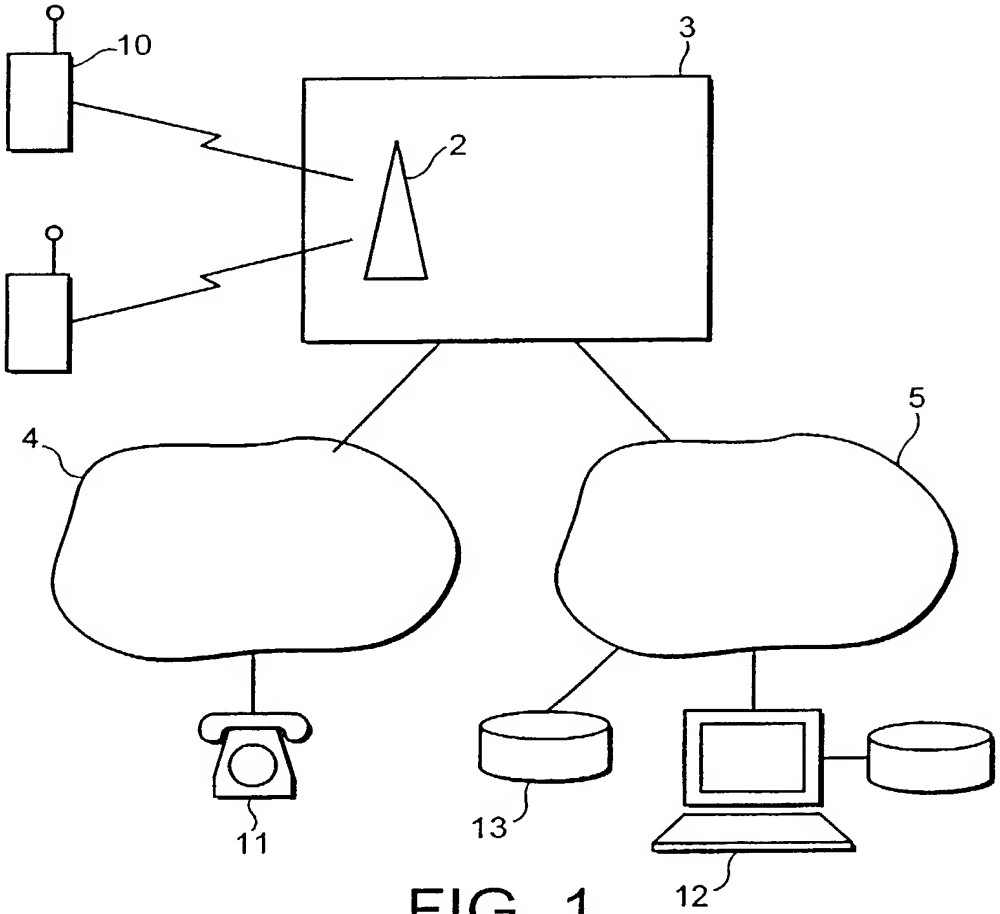

FIG. 1

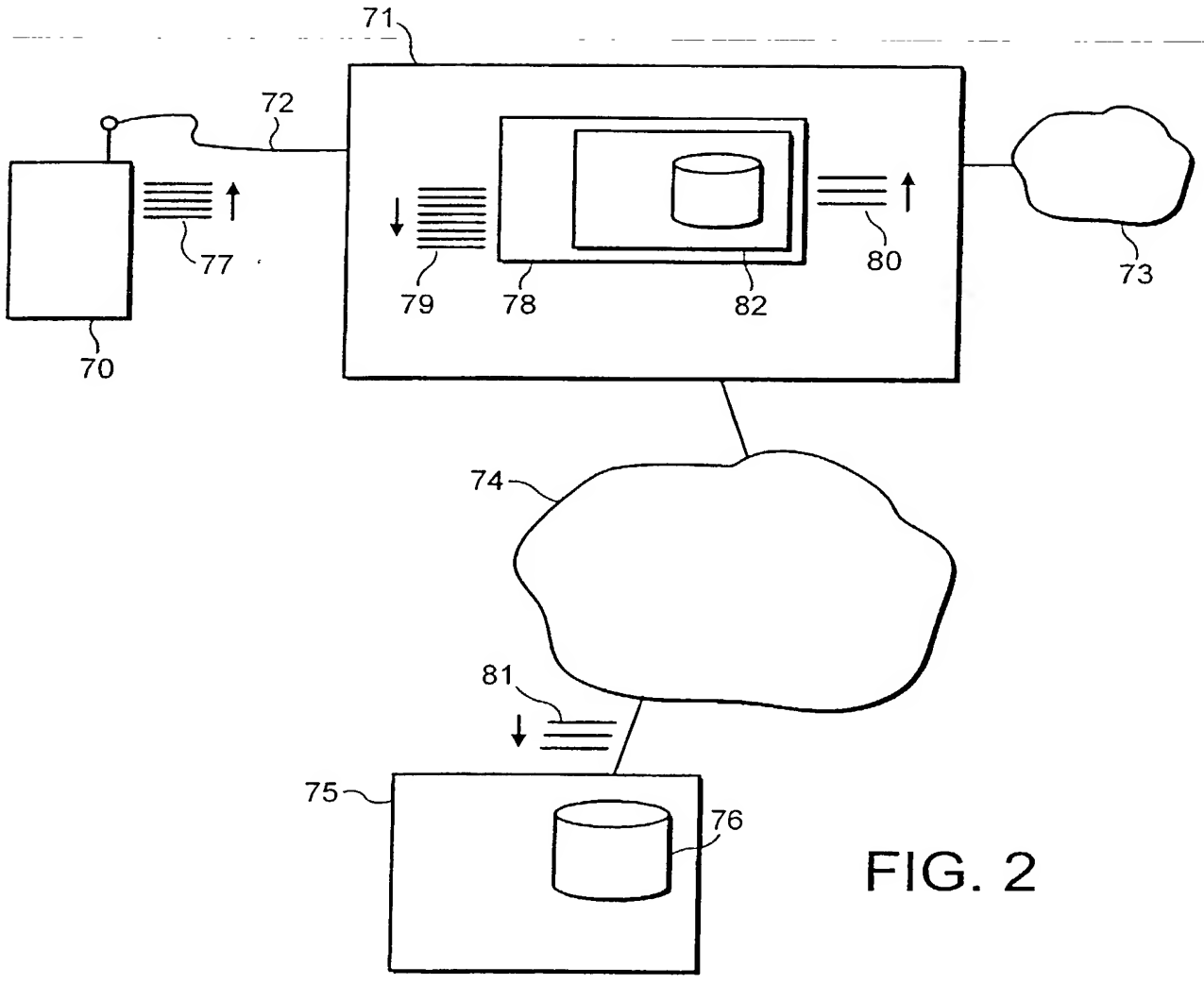

FIG. 2

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (Includes Reference to PCT International Applications)	Attorney's Docket No. 4925-218PUS

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SATISFYING DATA REQUESTS IN A TELECOMMUNICATION SYSTEM

the specification of which (check only one item below)

[] is attached hereto

[x] was filed as United States application

Serial No. 10/070,837

on March 11, 2002

and was amended

on March 11, 2002 (if applicable).

[] was filed as PCT international application

Number PCT/IB00/01322

on September 05, 2000

and was amended under PCT Article 19

on _ (if applicable).

I hereby state that I have reviewed and understand the contents of theabove-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

PRIOR FOREIGN/PCT APPLICATIONS AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

Country (if PCT, indicate "PCT")	Application Number	Date of Filing (day, month, year)	Priority Claimed Under 35 U.S.C. 119	
Great Britain	9921583.2	September 13, 1999	[x] YES	[] NO
PCT	PCT/IB00/01322	September 05, 2000	[x] YES	[] NO
			[] YES	[] NO
			[] YES	[] NO
			[] YES	[] NO
			[] YES	[] NO
			[] YES	[] NO

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (Includes Reference to PCT International Applications)	Attorney's Docket No. 4925-218PUS

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) at *Cohen, Pontani, Lieberman & Pavane* to prosecute this application and transact all business in the Patent and Trademark Office connected therewith

Customer number 27799

Send correspondence to *Cohen, Pontani, Lieberman & Pavane* at the address for the following customer Number: 27799	Direct Telephone calls to: (name and telephone number) Michael C. Stuart (212) 687-2770

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1-00 201	FULL NAME OF INVENTOR	FAMILY NAME USKELA	FIRST GIVEN NAME Sami	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY Espoo	STATE OR FOREIGN COUNTRY Finland FIX	COUNTRY OF CITIZENSHIP Finland
	POST OFFICE ADDRESS	POST OFFICE ADDRESS Keilalahdentie 4	CITY Espoo	STATE & ZIP CODE/COUNTRY FIN-02150 Finland
2-00 202	FULL NAME OF INVENTOR	FAMILY NAME RAUTIANEN	FIRST GIVEN NAME Aapo	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY Espoo	STATE OR FOREIGN COUNTRY Finland FIX	COUNTRY OF CITIZENSHIP Finland
	POST OFFICE ADDRESS	POST OFFICE ADDRESS Keilalahdentie 4	CITY Espoo	STATE & ZIP CODE/COUNTRY FIN-02150 Finland
3-00 203	FULL NAME OF INVENTOR	FAMILY NAME LEPPANEN	FIRST GIVEN NAME Eva	SECOND GIVEN NAME Maria
	RESIDENCE, CITIZENSHIP	CITY Espoo	STATE OR FOREIGN COUNTRY Finland FIX	COUNTRY OF CITIZENSHIP Finland
	POST OFFICE ADDRESS	POST OFFICE ADDRESS Keilalahdentie 4	CITY Espoo	STATE & ZIP CODE/COUNTRY FIN-02150 Finland
4-00 204	FULL NAME OF INVENTOR	FAMILY NAME TUDOSE	FIRST GIVEN NAME Lucia	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY Espoo	STATE OR FOREIGN COUNTRY Finland FIX	COUNTRY OF CITIZENSHIP Finland
	POST OFFICE ADDRESS	POST OFFICE ADDRESS Keilalahdentie 4	CITY Espoo	STATE & ZIP CODE/COUNTRY FIN-02150 Finland
5-00 205	FULL NAME OF INVENTOR	FAMILY NAME NIEMINEN	FIRST GIVEN NAME Mari	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY Espoo	STATE OR FOREIGN COUNTRY Finland FIX	COUNTRY OF CITIZENSHIP Finland
	POST OFFICE ADDRESS	POST OFFICE ADDRESS Keilalahdentie 4	CITY Espoo	STATE & ZIP CODE/COUNTRY FIN-02150 Finland

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DATE 19/08/02	DATE 16/08/02	DATE 20/8/02
SIGNATURE OF INVENTOR 204	SIGNATURE OF INVENTOR 205	SIGNATURE OF INVENTOR 206
DATE 23/08/02	DATE 29/08/02	DATE
Additional inventor(s) name(s) & address(es) attached? [ ] Yes [x] No		